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EXAMINER
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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 10/723,924
Filing Date: November 26, 2003
Appellant(s): BURCKART ET AL.

_____
Patrick Caldwell
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 07FEB2008 appealing from the Office action mailed

07SEP2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The Examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,105,067	Batra	AUG-2000		
2002/0156897 A1	Chintalapati et al.	OCT 2002		
7,076,556 B1	Brock et al.	JUL 2006		
C++ Plus Data Structures			Dale, Nell B.	2003
Data Structures and Other Objects Using C++			Main and Savitch	2001
Problem Solving with C++			Savitch, Walter	1999

The Authoritative Dictionary of IEEE Standards Terms   IEEE   2000

Oracle Internals Notes Asynchronous I/O   Ixora Pty Ltd. 2007

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1.   **Claims 1 and 3-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Batra**

(US Patent # 6,105,067) in view of **Chintalapati et al. (US Patent Publication # US**

2002/0156897 A1).

a) Consider **claim 1,** Batra clearly shows and discloses, a connection pool management

system comprising: a connection pool 120 configured to store a plurality of idle connections (figure

4, column 1 lines 10-14, column 3 lines 1-6 lines 24-26, column 7 lines 61-64column 11 lines 51-59);

and, a connection manager 110 programmed for coupling to said connection pool 120 (figure 4,

column 3 lines 45-54, column 7 lines 42-54, column 11 lines 41-59) and further programmed to

validate one of said idle connections (idle connections in which the elapsed time is greater than the

maximum age are disconnected and returned to the pool, i.e. the are deemed invalid)(column 11

lines 41-59 column 12 lines 1-16). However, Batra does not specifically disclose issuing a non-

blocking input/output (I/O) operation to each of said individual ones of said idle connections.

In the same field of endeavor, Chintalapati et al. discloses a mechanism for servicing

connections by disassociating processing resources from idle connections and monitoring idle

connections for activity wherein a poll adapter is able to use asynchronous (non-blocking

input/output (I/O) operation) features of the operating system to monitor connections for activity

(paragraph [0017], paragraph [0018], paragraph [0023], paragraph [0024]).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the

invention was made to incorporate the teachings of Chintalapati et al. into the teachings of Batra in

order to validate individual idle connections by issuing an asynchronous (non-blocking) operation.

Such a feature would have made the overall system of Batra more efficient by not issuing blocking

operations to idle connections that would waste resources in order to validate idle connections

(paragraph [0017], paragraph [0018]).

b) Consider **claim 3,** and **as applied to claim 1 above,** Batra as modified by Chintalapati et

al. clearly shows and discloses the claimed invention except that said connection pool 120 comprises

a configuration for a last-in first-out (LIFO) ordering of said idle connections.

Nonetheless, the Examiner takes Official Notice of the fact that it is notoriously well known

in the art that idle connections could be stored in a data structure configuration for a last-in first-out

(LIFO) ordering.

Therefore it would have been obvious to one of ordinary skill in the art at the time the

invention was made to use a last-in first-out (LIFO) ordering, as known in the art, in the system of

Batra as modified by Chintalapati et al. for the purpose of storing connections in a last-in first-out

(LIFO) ordering.

Upon appellant's challenge in 29MAY2007, the Examiner has cited the following factual

evidences in showing the use of LIFO ordering in the 07SEPT2007 Final Office Action:

- ➢ Brock et al. (US Patent # US 7,076,556 B1) disclose: "Method and Apparatus for Storage
  and Retrieval of Connection Data in a Communications System" in which connections are
  stored in a LIFO stack arrangement (column 4 lines 16-17).

- ➢ Dale, Nell B. (ISBN 9780763704810) "C++ Data Structures" which shows in section 4.1 a
  stack is defined as "An abstract data type in which elements are added and removed from
  only one end; a "last-in-first-out (LIFO)" structure" also in Appendix E The Standard

Template Library where that a stack if accessed on a LIFO basis (A Stack, with the usual

LIFO access).

➢ Main, Michael (ISBN 0201702975) "Data Structures and Other Objects Using C++" which

shows in section 7.1 "A stack is a Last-In/First-Out data structure." and section 7.3, which

shows stacks, can be implemented using assays.

➢ Savitch, Walter (ISBN 0201357496) "Problem Solving with C++, The Object of

Programming" which shows in section 12.1 "A stack is a last-in/first-out memory structure".

c) Consider **claim 4,** and **as applied to claim 1 above,** Batra as modified by Chintalapati et

al. clearly shows and discloses, said connection pool 120 comprises a configuration for storing a

global timestamp indicating a time value when an oldest one of idle connections had been added to

said connection pool 120 (column 11 lines 41-59).

d) Consider **claims 5 and 15,** Batra clearly shows and discloses, a connection pool

management method and a machine readable storage having stored thereon a computer program for

connection pool management comprising the steps of: responsive to adding a first one of a plurality

of idle connections to a connection pool 120, recording a global timestamp to indicate a time value

when said first idle connection had been added to said connection pool 120 (column 11 lines 41-59);

responsive to adding subsequent ones of said idle connections to said connection pool 120,

recording individual timestamps in said connection pool 120 in association with corresponding ones

of said subsequent ones of said idle connections(column 11 lines 44-54, column 12 lines 1-4 lines

12-16); comparing a timestamp of an oldest one of said idle connections to said global timestamp to

determine whether a timeout condition has arisen and (column 11 lines 41-59); and responsive to

determining that said timeout condition has arisen (periodically invoking a process to inspect

connections)(column11 lines 51-54), probing at least one of said idle connections in order to validate

said at least one of said idle connections (idle connections in which the elapsed time is greater than

the maximum age are disconnected and returned to the pool, i.e. the are deemed invalid)(column 11

lines 41-59 column 12 lines 1-16). However, Batra does not specifically disclose probing at least one

of said idle connections with a non-blocking input/output (I/O) request.

In the same field of endeavor, Chintalapati et al. discloses a mechanism for servicing

connections by disassociating processing resources from idle connections and monitoring idle

connections for activity wherein a poll adapter is able to use asynchronous (non-blocking

input/output (I/O) operation) features of the operating system to monitor connections for activity

(paragraph [0017], paragraph [0018], paragraph [0023], paragraph [0024]).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the

invention was made to incorporate the teachings of Chintalapati et al. into the teachings of Batra in

order to validate individual idle connections by issuing an asynchronous (non-blocking) operation.

Such a feature would have made the overall system of Batra more efficient by not issuing blocking

operations to idle connections that would waste resources in order to validate idle connections

(paragraph [0017], paragraph [0018]).

e) Consider **claims 6 and 16,** and **as applied to claims 5 and 15 above,** Batra as modified

by Chintalapati et al. clearly shows and discloses, said comparing step comprises the step of

comparing a timestamp associated with a least recently added connection in said connection pool to

said global timestamp to determine whether said timeout condition has arisen (column 11 lines 44-

59).

f) Consider **claims 7 and 17,** and **as applied to claims 5 and 15 above,** Batra as modified

by Chintalapati et al. clearly shows and discloses, said comparing step comprises the steps of:

summing said global timestamp and a pre-established timeout value (column 11 lines 45-54);

comparing said timestamp of said oldest one of said idle connections with said summed global

timestamp and pre-established time out value (column 11 lines 45-49); and, if said timestamp

exceeds of said oldest one of said idle connections exceeds said summed global timestamp and pre-

established timeout value, concluding that said timeout condition has arisen (column 11 lines 51-59).

     g) Consider **claims 8 and 18,** and **as applied to claims 5 and 15 above,** Batra as modified

by Chintalapati et al. clearly shows and discloses, said probing step comprises the steps of:

sequentially performing timestamp comparisons with said global timestamp for each of said idle

connections in said connection pool 120 (column 11 lines 51-65); However, Batra does not

specifically disclose that for each one of said idle connections having a timestamp which exceeds a

combination of said global timestamp and a pre-established timeout value, attempting a non-

blocking I/O operation over said one of said idle connections.

     In the same field of endeavor, Chintalapati et al. discloses a mechanism for servicing

connections by disassociating processing resources from idle connections and monitoring idle

connections for activity wherein a poll adapter is able to use asynchronous (non-blocking

input/output (I/O) operation) features of the operating system to monitor connections for activity

(paragraph [0023], paragraph [0024]).

     Therefore it would have been obvious to a person of ordinary skill in the art at the time the

invention was made to incorporate the teachings of Chintalapati et al. into the teachings of Batra in

order to attempt an asynchronous (non-blocking) operation in which a timestamp which exceeds a

combination of said global timestamp and a pre-established timeout value. Such a feature would

have made the overall system of Batra more efficient by not issuing blocking operations to idle

connections that would waste resources in order to validate idle connections when a timeout condition occurs.

h) Consider **claims 9 and 19,** and **as applied to claims 5 and 15 above,** Batra as modified by Chintalapati et al. clearly shows and discloses, further comprising the step of updating said global timestamp with a new value subsequent to probing said at least one of said idle connections (column 11 lines 41-59).

i) Consider **claims 10 and 20,** and **as applied to claims 5 and 15 above,** Batra as modified by Chintalapati et al. clearly shows and discloses the step of provisioning one of said idle connections responsive to a request to provision an idle connection in said connection pool 120 (column 9 lines 66-67, column 10 lines 1 -16). However, Batra as modified by Chintalapati et al. fails to disclose that the idle connection to be provisioned is a most recently used idle connection.

Nonetheless, the Examiner takes Official Notice because a last-in first-out (LIFO) ordering is used to store the idle connections that the most recently used idle connection (i.e. last-in) would be the first idle connection provisioned (i.e. first-out) should a request for a connection be made.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a last-in first-out (LIFO) ordering, as known in the art, in the system of Batra as modified by Chintalapati et al. for the purpose of storing connections in a last-in first-out (LIFO) ordering such that the most recently used connection would be the first one used for the next request for an idle connection.

j) Consider **claims 11 and 21,** and **as applied to claims 10 and 20 above,** Batra clearly shows and discloses, said provisioning step further comprises the steps of: probing said provisioned idle connection (column 9 lines 66-67, column 10 lines 1-5), where said provisioned idle connection fails to validate, provisioning another one of said idle connections (inherent from the teachings of

Batra since all idle connections are checked if one fails the test the next connection will)(column 10 lines 9-14). However, Batra does not specifically disclose probing said provisioned idle connection with a non-blocking input/output (I/O) request in order to validate said provisioned idle connection or removing said provisioned idle connection from said connection pool 120.

In the same field of endeavor, Chintalapati et al. discloses a mechanism for servicing connections by disassociating processing resources from idle connections and monitoring idle connections for activity wherein a poll adapter is able to use asynchronous (non-blocking input/output (I/O) operation) features of the operating system to monitor connections for activity (paragraph [0023], paragraph [0024]). Furthermore, Chintalapati et al. discloses that if said idle connection is found to be active it is passed to a work queue to await servicing by a processing resource (paragraph [0023] lines 7-9).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the teachings of Chintalapati et al. into the teachings of Batra in order to attempt an asynchronous (non-blocking) operation in order to probe connections in the connection pool 120 and to remove any connections found which failed to validate. Such a feature would have made the overall system of Batra more efficient by not issuing blocking operations to idle connections that would waste resources in order to validate idle connections and removing connections from the connection pool 120 which failed to validate so that system resources would not be wasted by probing connections which could not be used during subsequent requests for an idle connection.

k) Consider **claims 12 and 22,** and **as applied to claims 5 and 15 above,** Batra as modified by Chintalapati et al. clearly shows and discloses the claimed invention except the step of adding each of said idle connections to said connection pool 120 in a last-in first-out (LIFO) manner.

Nonetheless, the Examiner takes Official Notice of the fact that it is notoriously well known in the art that idle connections could be added to a connection pool 120 in a last-in first-out (LIFO) order.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a last-in first-out (LIFO) ordering, as known in the art, in the system of Batra as modified by Chintalapati et al. for the purpose of storing connections in a last-in first-out (LIFO) order.

l) Consider **claims 13 and 23,** and **as applied to claims 12 and 22 above,** Batra as modified by Chintalapati et al. clearly shows and discloses, said adding step further comprises the step of recording a timestamp in said connection pool 120 for each added one of said idle connections to indicate when said added one of said idle connections had been added to said connection pool 120 (column 11 lines 45-51).

m) Consider **claims 14 and 24,** and **as applied to claims 5 and 15 above,** Batra as modified by Chintalapati et al. clearly shows and discloses, further comprising the step of removing from said connection pool each said idle connection which fails validation in said probing step (column 111 lines 40-65, column 12 lines 10-16).

2.   **Claims 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Batra (US Patent # 6,105,067)** as modified by **Chintalapati et al. (US Patent Publication # US 2002/0156897 A1)** in further view of **Brock et al. (US Patent # US 7,076, 556 B1).**

a) Consider **claim 2,** and as applied to **claim 1** above, Batra as modified by Chintalapati et al. clearly shows and discloses, a timestamp data member (wherein a timestamp is associated with each connection)(column 11 lines 45-54, column 12 lines 1-4 lines 12-16) and a reference to one of said idle connections (inherent from the teachings of Batra since each connection is stored in the connection pool and reference to the connection must be present)(column 11 lines 45-51, column 12 lines 1-4). However, Batra as modified by Chintalapati et al. does not specifically disclose that said connection pool 120 has an array configuration.

Brock et al. shows and discloses a method and apparatus for the storage and retrieval of connection data in a communications system that stores connections in a last-in-first-out stack (array) arrangement (column 4 lines 16-17).

Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Brock et al. into the system of Batra as modified by Chintalapati et al. for the purpose storing connections (abstract, column 4 lines 7-20).

(10) **Response to Argument**

The Examiner summarizes the various points raised by the Appellants and addresses replies individually.

As per Appellants' argument that:

Argument (1) Appellants allege numerous times throughout the arguments that issuing a non-blocking I/O operation to the idle connection is not taught by Chintalapati.

In reply to argument (1), the Examiner has repeatedly indicated to Appellants throughout prosecution Asynchronous I/O is a non-blocking I/O operation. They are two different names for the same technology well known in the art. This is evidently supported by "The Authoritative

Dictionary of IEEE Standards Terms" published by IEEE in 2000 and "Oracle Internals Notes

Asynchronous I/O" by Ixora Pty Ltd. in 2007.

> ➤ ***Asynchronous I/O operation*** *- **(2)** An I/O operation that does not of itself cause the task*
>   *requesting the I/O to be blocked. This implies the requesting task and the I/O operation maybe*
>   *running concurrently. (IEEE, page 58)*

> ➤ ***Asynchronous I/O*** *- Asynchronous I/O means non-blocking I/O. (Ixora)*

For this reason, Chintalapati clearly teaches the use of Asynchronous (non-blocking) I/O

when polling connections as indicated in the previous Office Actions.

Argument (2) "… the teachings being relied upon Chintalapati do not teach the claimed

limitations. Specifically, completely absent from the teachings of Chintalapati is the notion of

validating an idle connection by issuing a non-blocking I/O operation to the idle connection.

Instead, Chintalapati teaches polling connections to determine whether or not events are pending

and whether or not a connection is active or remains idle. Moreover, Chintalapati also describes

closing connections that have been idle for a predetermined time period, which teaches away from

the claimed invention."

In reply to argument (2) the Examiner has shown above that asynchronous I/O and non-

blocking I/O are in fact two terms for the same technology. As stated by Appellants, "to validate a

connection is to determine that the connection is useable." (Appellants' arguments page 5 lines 26-

28) As Appellants have stated Chintalapati teaches polling connections to determine whether or not

events are pending and whether or not a connection is active or remains idle (abstract, paragraph

[0017], [0018], [0023], [0024], [0032], [0095], [0096]). From Chintalapati:

[0023] The poll adapter uses the synchronous or asynchronous features of the operating system to monitor the connection for activity, such as by polling the connections to determine whether any events are pending. Based on the poll results from the poll adapter, the poll thread for the poll subset determines whether the connection is now active or remains idle. If the connection is active, the poll thread passes the connection to the work queue to await servicing by a processing resource. If the connection is still idle, the connection remains in the poll subset. The poll threads poll the connections in each subset according to a predefined interval of time. The poll threads may track how long each connection is idle and close connections that have been idle for a predetermined time period.

[0024] By disassociating processing resources from idle connections and monitoring the idle connections for activity, the present invention eliminates the waste of system resources that results from the connection servicing approaches of the prior art. Thus, the present invention provides an improved mechanism for servicing connections.

This is in fact the claimed invention. By polling connections Chintalapati determines whether an event is pending (i.e. the connections is going to be used), a connection is active (i.e. being used currently), or idle (i.e. not being used, therefore useable on demand or as defined by Appellants "valid"). Chintalapati determines whether a connection is idle (i.e. valid/usable) by polling the connection issuing an asynchronous (non-blocking) I/O operation. Therefore, Chintalapati clearly discloses determining whether or not a connection is valid (usable) by issuing a non-blocking I/O operation and meets the claim language of "to validate individual ones of said idle connections by issuing a non-blocking input/output operations…".

Regardless of whether Chintalapati teaches closing connections that have been idle for a predetermined period of time Chintalapati still teaches monitoring connections for activity during that time period and thus teaches the claimed invention (abstract, paragraph [0023], [0024], [0032], [0095], [0096]). Before the time period elapses Chintalapati clearly discloses determining whether a connection is active (invalid) or idle (valid) by issuing an asynchronous (non-blocking) I/O operation and, as such, does not teach away from the claimed invention.

   Argument (3) "As the term "validate" is used consistent with Appellants' specification (e.g.,

see paragraph [0005]), a valid connection is one that is useable on demand, and to validate a

connection is determine that the connection is useable. The teachings of Batra, however, are not

directed to determining whether a particular connection is useable. Instead, Batra is directed to

disconnecting connections that have been idle for too long (i.e., see column 11, lines 54-59)."

   In reply to argument (3) the Examiner has taken the term validate to be defined as

determining whether a connection is usable, an active connection as one that is not usable, and an

idle connection as one that is usable. Batra clearly discloses monitoring connections to determine if

they are active or idle (column 11 lines 40-67, column 12 lines 1-16). Therefore, Batra discloses

determining whether a connection is usable. Regardless of whether Batra teaches closing

connections that have been idle for a predetermined period of time Batra still teaches monitoring

connections for activity during that time period and thus teaches the claimed invention. Before the

time period elapses Batra clearly discloses determining whether a connection is active

(invalid/unusable) or idle (valid/usable) and, as such, teaches from the claimed invention.

   Furthermore, Appellants do not explicitly define the term validating. The claims do not

specifically define what the connection are being validated for. Therefore, the Examiner has used the

broadest reasonable interpretation.

   ### MPEP 904.01 Analysis of Claims
   The breadth of the claims in the application should always be carefully noted; that is, the
   examiner should be fully aware of what the claims do not call for, as well as what they do
   require. During patent examination, **the claims are given the broadest reasonable**
   interpretation *consistent with the specification. See In re Morris, 127 F.3d 1048, 44*
   USPQ2d 1023 (Fed. Cir. 1997). See MPEP § 2111 - § 2116.01 for case law
   pertinent to claim analysis.

Argument (4) Appellants argue that the Examiner's reasons for combining Batra and Chintalapati are invalid and that the Examiner has failed to supply any factual support for the combination.

"...the Examiner's asserted benefit (i.e., "would have made the overall system of Batra more efficient by not issuing blocking operations to idle connections") for the proposed modification is pulled directly from Appellants' disclosure and is completely absent for the teachings of the applied prior art. It is well-established law that the "[d]etermination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention." Moreover, Appellants' disclosure is forbidden territory for the Examiner to obtain the requisite rationale for combining the applied prior art.[2] Thus, Appellants respectfully submit that the Examiner has failed to establish a prima facie case of obviousness in rejecting claim 1.

At the outset, Appellants note that the Examiner's asserted benefit for the proposed modification (i.e., "would have made the overall system of Batra more efficient by not issuing blocking operations to idle connections that would waste resources in order to validate idle connections") is not disclosed by paragraphs [0017] and [0018]. Instead the Examiner's newly cited passages refer to improving efficiency by having each connection capable of being serviced by many worker threads. This teaching, however, is not comparable to increasing efficiency "by not issuing blocking operations to idle connections that would waste resources in order to validate idle connections."

Regarding the Examiner's citation that a conclusion of obviousness may be based upon "knowledge which was within the level of ordinary skill at the time the claimed invention was

made," the Examiner has failed to factually establish that this knowledge was within the level of

ordinary skill at the time of the invention." "

In reply to (4) the Examiner is aware that Appellants' reason for issuing asynchronous I/O

operations over synchronous I/O operations is for the sake of efficiency. However, because the

Examiner used the efficiency of issuing an asynchronous I/O operation over that of a synchronous

I/O operation for validating connection as motivation for combining references does not mean that

the Examiner's motivation was pulled directly from Appellants' disclosure. It would have been

obvious to one of ordinary skill in the art issuing asynchronous I/O operations for polling

connections would be more efficient than issuing synchronous I/O operations because they do not

block the connection which they are polling in order to determine if it is active or idle. As stated in

the definition above, "*the requesting task and the I/O operation maybe running concurrently*" meaning the

connection being polled by the asynchronous I/O operation is not blocked by the I/O operation.

Which translates to greater efficient because the idle connection is not prevented from being

allocated by being polled and could still be used even though it is in the process of being polled.

Several of the KSR rationales to support rejection under 35 U.S.C. 103 apply in the case and

are detailed below:

MPEP 2141 III. RATIONALES TO SUPPORT REJECTIONS UNDER 35 U.S.C.
103

*The proper analysis is whether the claimed invention would have been obvious to one of
ordinary skill in the art after consideration of all the facts. See 35 U.S.C. 103(a). Factors
other than the disclosures of the cited prior art may provide a basis for concluding that it
would have been obvious to one of ordinary skill in the art to bridge the gap. The
rationales discussed below outline reasoning that may be applied to find obviousness in
such cases.*

Exemplary rationales that may support a conclusion of obviousness include:

> (A)   *Combining prior art elements according to known methods to yield*
> *predictable results;*
> (B)   *Simple substitution of one known element for another to obtain predictable*
> *results;*
> (C)   *Use of known technique to improve similar devices (methods, or products)*
> *in the same way;*
> (D)   *Applying a known technique to a known device (method, or product) ready for*
> *improvement to yield predictable results;*
> (E)   *"Obvious to try " – choosing from a finite number of identified, predictable*
> *solutions, with a reasonable expectation of success;*
> (F)   *Known work in one field of endeavor may prompt variations of it for use in*
> *either the same field or a different one based on design incentives or other market*
> *forces if the variations are predictable to one of ordinary skill in the art;*
> (G)   *Some teaching, suggestion, or motivation in the prior art that would have led*
> *one of ordinary skill to modify the prior art reference or to combine prior art*
> *teachings to arrive at the claimed invention. See MPEP § 214 3 for a discussion of*
> *the rationales listed above along with examples illustrating how the cited rationales*
> *may be used to support a finding of obviousness. See also MPEP § 2144 - §*
> *2144.09 for additional guidance regarding support for obviousness determinations.*

(A) Combining prior art elements according to known methods to yield predictable results.

It is well known to on of ordinary skill in the art that asynchronous I/O operations are non-blocking

operations . Therefore, it would have been obvious to one of ordinary skill in the art to take a

known element, the issuing of an asynchronous I/O operation of Chintalapti, and combine it with

the connection pool management system of Batra to yield predictable results, greater efficiency due

to the elimination of wasted resources caused by issuing synchronous I/O operations.

(B) Simple substitution of one known element for another to obtain predictable results; Both

Batra and Chintalapti clearly disclose monitoring connections to determine if they are active or idle.

It would have been obvious to one of ordinary skill in the art to substitute the known element of

asynchronous I/O from Chintalapati into the system of Batra to yield predictable results of more

efficient monitoring of connections in a connection pool by eliminating wasted resources.

(C) Use of known technique to improve similar devices (methods, or products) in the same way; Both Batra and Chintalapti clearly disclose similar devices for monitoring connections to determine if they are active or idle. Therefore, it would have been obvious to one of ordinary skill in the art to use the well known technique of issuing asynchronous I/O operations as disclosed by Chintalapati in the system of Batra to eliminate the wasting of resources for improved efficiency.

(D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; asynchronous I/O is well known in the art as shown above. Connection pools and connection pool management systems are well known in the art as shown by Batra and Chintalapti. Therefore, it would have been obvious to one of ordinary skill in the art to apply the known technique of issuing an asynchronous I/O operation to connections in a connection pool to yield the predictable result of an overall system that does not waste resources by issuing synchronous I/O operations and blocking connections and thus increasing efficiency.

(E) "Obvious to try" – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; Given that issuing of I/O operations (both synchronous and asynchronous) is a well known technique in order to determine whether a connection if active or idle. It would have been obvious to a person of ordinary skill in the art to try to use the asynchronous I/O operations of Chintalapati in the system of Batra in order to eliminate waster resources by issuing synchronous I/O operations with a reasonable expectation of success.

(F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; Both Batra and Chintalapati disclose known work of monitoring connections in the same field of endeavor. Chintalapati discloses the use of the known technique of issuing an asynchronous I/O operation to monitor connection in order to conserve

resources when monitoring connections. The common design incentive of improving efficiency would have been obvious to one of ordinary skill in the art and prompted one of ordinary skill in the art to improve efficiency using a know and predicable variation such as using asynchronous I/O over synchronous I/O in order to improve efficiency by conserving resources.

(G)   Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. As the Examiner has already pointed out numerous times there is ample evidence in the prior art itself to provide motivation to combine. As shown above Chintalapati clearly states eliminating the wasting of resources to provide and improved mechanism for servicing connections (paragraph [0023] [0024]) as a reason to using asynchronous I/O. Chintalapati clearly used asynchronous I/O in order to avoid using resources by blocking connections simply to determine if they are active or idle, thereby improving efficiency which provides ample motivation to combine.

Furthermore, in response to Appellants' argument that the Examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Appellant's hindsight argument ignores the fact that asynchronous I/O operation's well known and obvious non-blocking characteristics were well known that the time the invention was made.

In response to Appellants' argument that the Examiner motivation is completely absent from the teachings of the applied prior art the Examiner respectfully disagrees. Chintalapati clearly discloses determining if connections are active or idle by issuing asynchronous I/O. Chintalapati clearly shows that efficiency advantages of using asynchronous I/O operations to service connections (paragraph [0017], [0018], [0024]) not only are the asynchronous I/O operations used as the Appellants argue but are also used as they are in the claimed invention to poll connections to determine if they are active or idle (abstract, paragraph [0023]). Chintalapati clearly discloses using asynchronous I/O to avoiding consuming processing resources to monitor idle connections for activity. The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Furthermore, the fact that both Batra and Chintalapati are shown to operate in the same environment (i.e. both are monitoring connections in a connection pool to determine if they are active or idle) is motivation enough to combine.

In response to Appellants' argument that the Examiner has failed to factually establish that this knowledge was within the level of ordinary skill at the time of the invention the Examiner respectfully disagrees as stated in the above arguments and shown in the very definition as defined by the IEEE in the year 2000 that asynchronous I/O is non-blocking I/O and that the advantages of not blocking resources being monitors would have been obvious to one of ordinary skill at the time the invention was made.

Argument (5) In the First Amendment, Appellants challenged the Examiner taking official notice of the fact that "it is notoriously well known in the art that idle connections could be stored in a data structure configuration for a last-in first-out (LIFO) ordering." Appellants also argued even if the Examiner can establish that the claimed missing elements are "well-known" in the art, the Examiner has still failed to establish a rationale for the modification.

However, although these references describe using LIFO ordering for data structures, the Examiner has failed to establish that using LIFO ordering for "idle connections" is notoriously well-known.

The Examiner also cited case law for the proposition that a conclusion of obviousness may be based upon "knowledge generally available to one of ordinary skill in the art." The Examiner's analysis, however, is incomplete. Specifically, the Examiner has failed to factually establish a common sense rationale (e.g., knowledge generally available to one of ordinary skill in the art) that would have impelled one having ordinary skill in the art to make the proposed modification. The Examiner cannot simply rely upon knowledge generally available to one of ordinary skill in the art and not explain what that knowledge is and factually establish that the knowledge is, indeed, generally available to one of ordinary skill in the art.

In reply to argument (5), Examiner has provided ample evidence that the concept if LIFO is well known in the art. Appellants attempt to make the point that the references used solely apply to data structures and because idle connections are being ordered it wouldn't be apparent to one of ordinary skill in the art to use a LIFO ordering. The Examiner respectfully disagrees, the art to which Appellants are referring to is rife with computer programming languages and techniques and the use of data structures (e.g. arrays) as well as related ordering techniques (LIFO, FIFO (First In

First Out). In fact Appellants' own specification points to the connection pool using an array/array type data structure configuration to store the idle connections (paragraph [0007], [0018]). As is well known in the art an array is a type of data structure and as such the references relied upon by the Examiner to provide evidence that LIFO ordering is well known in the art directly applies to Appellants' claimed invention. Appellants imply that because Appellants are ordering idle connections that somehow techniques well known in the art do not apply. What an array/data structure contains has no direct bearing on how it is ordered. Whether it be idle connections, a list of names, or any other data. The method of ordering an array (i.e. LIFO) is determined by how the array is to be accessed.

Appellants also allude to a lack of common sense rationale that would have impelled one of ordinary skill in the art to make the proposed modification. Common sense dictates that if one wants the most recent item added to an array the first one that would be retrieved would be that last one that was inserted, which, would naturally lead one to the use of a LIFO ordering. LIFO ordering is a common technique used when working with data structures and therefore would be an obvious choice when that last thing inserted into the array was to be the first thing retrieved. The very name (LIFO) would be enough to cause one of ordinary skill in the art to apply this obvious ordering to an array to ensure the last idle connection in was the first idle connection out.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the Examiner in the Related

Appeals and Interferences section of this Examiner's Answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

DCM

/DCM/

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